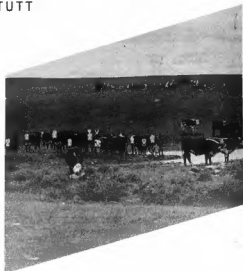


R. G. IRONSIDE

**AN ECONOMIC CLASSIFICATION
OF LAND IN THE GOVENLOCK - EASTEND -
MAPLE CREEK AREA, SASKATCHEWAN, 1946**

by

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ECONOMICS DIVISION · MARKETING SERVICE
CANADA DEPARTMENT OF AGRICULTURE
IN CO-OPERATION WITH THE
DEPARTMENT OF FARM MANAGEMENT
UNIVERSITY OF SASKATCHEWAN

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AN ECONOMIC CLASSIFICATION OF LAND
IN THE
GOVERNLOCK-EASTEND-MAPLE CREEK AREA
SOUTH-WEST SASKATCHEWAN, 1946

R.A. Stutt^{1/}

INTRODUCTION

During the summer of 1946 the program of an economic classification of land in Saskatchewan was extended to a block of twenty municipal units in the extreme southwest corner of the province. The selection of this area completes the classification of land according to suitability for wheat production, for all of South Western Saskatchewan. It joins up with the areas classified in 1939^{2/} and with an area of a similar program of research underway in Alberta.^{3/}

^{1/} Economist, Dominion Economics Division, Department of Agriculture, University of Saskatchewan, Saskatoon.

^{2/} "An Economic Classification of Land in Fifty-Six Municipal Divisions, South Central Saskatchewan" - C.C. Spence and E.C. Hope. Technical Bulletin No. 36, Dominion Department of Agriculture.

For reports on subsequent surveys in Saskatchewan see:

- (a) "An Economic Classification of Land and Its Relation to Farm Income, Eyebrow-Lacadena Area, Saskatchewan, 1939-40," C.C. Spence, S. Mysak and R.A. Stutt, Processed Report, Dominion Department of Agriculture.
- (b) "An Economic Classification of Land in the Weyburn-Estevan Area, Saskatchewan, 1941." R.A. Stutt and S. Mysak, Processed Report, Dominion Department of Agriculture.
- (c) "An Economic Classification of Land and Its Relation to Farm Types and Income, Blucher-Colonsay Area, Saskatchewan, 1940-1941," C.C. Spence, Processed Report, Dominion Department of Agriculture.
- (d) "A Farm Business Study with Particular Reference to the Relation of Farm Types and Land Class, Cory-Asquith-Langham Area, Saskatchewan, 1943," R.A. Stutt, Processed Report, Dominion Department of Agriculture.
- (e) "An Economic Classification of Land in the Elrose-Rosetown-Conquest Area, Saskatchewan, 1944." R.A. Stutt, Processed Report, Dominion Department of Agriculture.
- (f) "A Farm Business Study in the Fox Valley-Eston-Kindersley Area of Saskatchewan, 1947," T.O. Riecken and M.E. Andal, Processed Report, Dominion Department of Agriculture.

^{3/} "An Economic Classification of Land in South Eastern Alberta." S. Mysak and C.C. Spence, Dominion Department of Agriculture. Survey and report in progress.

Much concern has been expressed over the general productivity of this area. The features of a low level of average wheat yields and the extreme variability of yield from year to year are typical for this semi-arid country. Distress and hardships were particularly prevalent there in the 1930's and during an earlier period of 1917-19. Over large areas of land periods of uncertainty of crop yields and farm returns have been reflected by the several stages of abandonment of land and farmsteads, resettlement and reabandonment, and the consolidation of the remaining farms into economic units of size compatible with the physical characteristics of the land. Land use has alternated in the poorer areas between arable farming and grazing which, for most practical purposes is the only alternative. All the experience and evidence of farming in this area points to the necessity of an adjustment in land use to conform with a desired balance between farm population and available land resources.

In this study, as in all surveys relating to the program of an economic classification of land, it has been assumed that past performance of the land is the most reliable guide to future production. Accordingly, farmers' estimates of the average wheat yields over a relatively long period (mostly since 1921) have been used to express, through a budgetary approach of a typical farm organization of typical size and operated by a farmer of average ability, the possible performance to be expected from parcels of land for each soil type.

The Area

The area selected for the 1946 survey was in the extreme southwest corner of the province. It extended from Range 19 to the Alberta border and from the International boundary up to and including Township 15. The area breaks down into four sub-areas. There is a large block of relatively level topography but of inferior quality of soils commonly called "burnouts" on the southern edge from Climax west to Rebsart and Covenlock. On the eastern slopes of the Cypress Hills from Eastend to Shaunsvon to Gull Lake is an area of relatively favourable

conditions for arable farming. The rough, hilly and wooded Cypress Hills area is utilized largely for grazing purposes and for cereal production on isolated parcels. North of the Cypress Hills is an area characterized by soils of light texture, mainly sands, sandy loams and light loams. Crop production is hazardous due to the inferior drought resisting qualities of the soil; thus many farmers have extensive cattle and sheep enterprises.

The following municipal units^{1/} are included in the study area:

Frontier	No. 19	L.I.D.	No. 81
L.I.D.	No. 20	L.I.D.	No. 82
L.I.D.	No. 21	Carmichael	No. 109
L.I.D.	No. 22	Pisapot	No. 110
White Valley	No. 49	Maple Creek	No. 111
L.I.D.	No. 50	L.I.D.	No. 112
Reno	No. 51	Gull Lake	No. 139
L.I.D.	No. 52	L.I.D.	No. 140
Arlington	No. 79	Big Stick	No. 141
L.I.D.	No. 80	Bitter Lake	No. 142

Number of Farms

The 1946 Census of Agriculture indicated a total of 3509 occupied farms and 715 non-resident farms. This represents a decrease of approximately 9 per cent as compared with those reported in the 1941 Census.

During the course of the survey in 1946, a complete ownership and occupancy record was made of each parcel of land. Table I shows the number of occupied farm units and other farm types, termed non-farm units, according to municipal unit as compared with the 1946 Census. An occupied farm unit is one on which the operator resides, at least for the major portion of the year, and which includes all lands under his control by various tenures. This designation also applies to all non-contiguous parcels. It also includes farm units sometimes called family farms on which sons or relatives often reside with the parents but operate land in their own names. Where these lands are farmed as

^{1/} Local Improvement Districts Nos. 20, 21, 22, 50, 52 and 80 have been reorganized into Administrative Unit no. 926. Local Improvement Districts Nos. 81, 82, 112 and township 13, ranges 28, 29 and 30 of L.I.D. No. 142 have been reorganized into Administrative Unit No. 929. Rural Municipality of Enterprise No. 170 has been added to the remaining part of L.I.D. No. 142. L.I.D.'s. Nos. 140 and 170 have been reorganized into Administrative Unit No. 932.

one unit with common machinery and equipment under conditions where all family labour is pooled they are included as one occupied farm unit. Non-farm units are those self-operated by a town resident whose main business is other than farming. The land is often operated by casual hired labour or custom outfits and parcels are often widely separated.

In Table I, the total of farms covered in the 1946 survey (occupied farm units plus non-farm units) is compared directly with occupied resident farms (occupied farms less non-resident farms) as enumerated in the 1946 Census. This table indicates that the ratios of the number of farms enumerated under separate methods were approximately the same throughout the whole area. Comparing the figures obtained by the Economic Survey with those given in the 1946 Census the extreme range of variation was from nine per cent above to 18 per cent below; usually, however, variation was within three or four per cent.

The table also indicates the sparseness of settlement in certain municipal units and the concentration of farms in the eastern side of the area.

Table 1.-Number of Farms in the Govenlock-Eastend-Maple Creek Area,
Southwest Saskatchewan, 1946

R.M. or L.I.D.	1946 Survey			1946 Census			1946 Survey Farms as Per Cent of Census Occupied Resident Farms
	Occupied Farm Units	Non- Farm Units	Total	Occupied Farms	Non- Resident Farms	Occupied Resident Farms	
19	167	6	173	208	29	179	96.6
20	80	4	84	106	5	101	83.2
21	66	4	70	84	6	78	89.7
22	36	-	36	58	8	50	72.0
49	171	20	191	241	39	202	94.6
50	141	15	156	180	23	157	99.4
51	164	7	171	205	48	157	108.9
52	66	2	68	93	17	76	89.5
79	217	27	244	339	92	247	98.8
80	151	3	154	204	54	150	102.7
81	62	3	65	87	21	66	98.5
82	57	-	57	58	-	58	98.3
109	251	10	261	339	81	258	101.2
110	166	2	168	218	49	169	99.4
111	160	12	172	211	44	167	103.0
112	124	3	127	163	27	136	93.4
139	177	13	190	247	63	184	103.3
140	59	1	60	86	29	57	105.3
141	152	7	159	221	42	179	88.8
142	112	8	120	161	38	123	97.6
Total	2579	147	2726	3509	715	2794	97.6

AN ECONOMIC CLASSIFICATION OF LAND

The basis of the economic classification of land for the plains region of Saskatchewan is the estimated potential productivity of land in terms of wheat production. Wheat is the predominant and major enterprise on prairie farms. All evidence indicates that wheat is the main source of revenue and returns more net income per acre than any other farm enterprise over such a wide area. In addition to the physical factors of soil, topography and climate, economic factors give an advantage to wheat production.

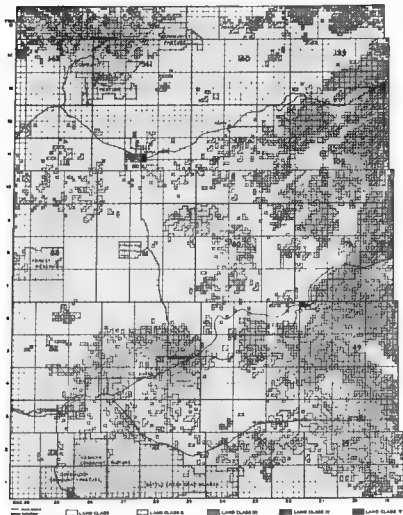
It may be said that the primary objective of land classification is to influence people to make wise decisions about land and the use of land. This includes practical use by the farmer in organizing the farm into an effective and efficient unit as well as public use in the fields of administration, credit, taxation, public aid and relief, government services, conservation and development.

The process of land classification is to group agricultural land of similar physical and economic characteristics from the standpoint of its highest and best use. It is an organized program of grading all parcels of land on a uniform comparative basis. Thus parcels of land of the same land class have similar use capabilities in various parts of the prairie region and can be compared directly.

This classification grades parcels of land only according to their wheat-producing capacity, although it does reflect the relative position of its other uses. Land Class I - termed submarginal for wheat production and better suited to grazing is not further classified on its capability for grazing as would conceivably be the next step. Where conditions are favourable, however, for alternative uses such as forestry an additional classification would be required based on the suitability of land for this use.

AN ECONOMIC CLASSIFICATION OF LAND

GOVENLOCK—EASTEND—MAPLE CREEK AREA



Land classification for wheat production should have a special significance in this area due to the relatively low level of productivity and wide variability of yield. The wide range in rainfall from year to year and the frequency of extensive drought periods results in crop production being carried on with minimum moisture requirements. This factor together with other detrimental physical factors often leaves a very narrow margin of safety with respect to the growing of wheat.

Proportion of Total Area in Each Land Class

The final tabulation of the economic classification of the area indicates a total of 3,888,623 acres in the twenty municipal units. By far the greatest proportion of the area was classified as Land Class I - sub-marginal for wheat production. Arranged according to each grade of land, 71.7 per cent was in Land Class I; 24.7 per cent in Land Class II - marginal for wheat production; 12.2 per cent was in Land Class III - fair wheat land; and 1.4 per cent in Land Class IV - good wheat land. There were no parcels of land graded as Land Class V - excellent wheat land.

Table 2 shows the breakdown for each municipal unit according to land class.

Table 2.-Acreage and Percentage of Total Land Area in Each Land Class by Municipal Unit,
Covenant-Excluded-Maple Creek Area, Saskatchewan, 1946

Municipal Unit	No.	Total Acres	Land Class				Land Class				Land Class			
			I		II		III		IV		V		VI	
			Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
R.M. Frontier	19	206,882	111,201	53.7	76,184	37.0	19,197	9.3	-	-	-	-	-	-
L.I.D.	20	206,489	169,195	82.0	29,380	14.2	7,914	3.8	-	-	-	-	-	-
L.I.D.	21	206,869	183,143	88.5	21,500	10.4	2,226	1.1	-	-	-	-	-	-
L.I.D.	22	197,741	185,446	93.8	9,090	4.6	3,205	1.6	-	-	-	-	-	-
R.M. White Valley	49	197,615	60,516	30.6	47,225	23.9	86,382	43.7	3,492	1.8	-	-	-	-
L.I.D.	50	205,563	141,584	68.9	34,054	16.6	29,925	14.5	-	-	-	-	-	-
Reno	51	199,351	128,161	64.3	43,865	22.0	27,325	13.7	-	-	-	-	-	-
L.I.D.	52	187,790	159,716	84.5	19,473	10.4	9,601	5.1	-	-	-	-	-	-
R.M. Arlington	79	206,271	83,861	40.6	36,216	17.6	74,221	36.0	11,973	5.8	-	-	-	-
L.I.D.	80	206,529	156,205	75.6	32,778	15.9	16,103	7.8	1,443	0.7	-	-	-	-
L.I.D.	81	193,647	185,208	95.6	8,439	4.4	-	-	-	-	-	-	-	-
L.I.D.	82	141,907	135,441	95.5	5,991	4.2	475	0.3	-	-	-	-	-	-
R.M. Carmichael	109	206,525	75,535	36.6	32,163	15.6	65,933	31.9	32,894	15.9	-	-	-	-
R.M. Papiot	110	205,183	152,362	74.2	30,297	14.8	20,764	10.1	1,760	0.9	-	-	-	-
R.M. Maple Creek	111	200,025	182,421	91.2	17,444	8.7	160	0.1	-	-	-	-	-	-
L.I.D.	112	161,804	135,391	83.7	23,515	14.5	2,898	1.8	-	-	-	-	-	-
R.M. Gull Lake	139	203,733	117,972	57.9	25,956	12.7	57,432	28.2	2,373	1.2	-	-	-	-
L.I.D.	140	202,280	184,651	91.3	13,946	6.9	3,683	1.8	-	-	-	-	-	-
R.M. Big Stick	141	204,712	143,442	70.1	34,162	16.7	27,108	13.2	-	-	-	-	-	-
R.M. Bitter Lake	142	147,707	99,282	67.2	29,324	19.9	19,101	12.9	-	-	-	-	-	-
		3,888,623	2,789,733	71.7	571,302	14.7	473,653	12.2	53,935	1.4	-	-	-	-



Good wheat land, with rough and hilly grazing land in background,
Eastern slopes of Cypress Hills area between
Eastend and Dollard.



Indicative of the wide expanse of grazing lands
south and west of Eastend.

Extensive areas were graded as submarginal for wheat production in three of the four sub-areas outlined in a previous section. This appraisal was based on the experience of those operating the land. In the southern part of the area a combination of low and variable rainfall and general hardpan soil condition was the main reason for rating these lands submarginal. In the Cypress Hills area a large block of land was classified as submarginal for wheat largely because of rough topography and low arability. In the areas north of the Cypress Hills the light texture of the sandy soils combines with semi-arid conditions to make arable agriculture extremely hazardous. In most parts this submarginal land was used for grazing while in the Cypress Hills certain sections were reserved for forestry.

In only three municipal units (R.M. No. 49, 79 and 109) did the percentage of total area in Land Class I average less than 50 per cent. In L.I.D's Nos. 20, 21 and 22 approximately 82, 88 and 94 per cent, respectively, of the land was classified as Land Class I. Practically all of L.I.D's Nos. 81 and 82 (Cypress Hills) - 96 per cent in each case - was Land Class I. In L.I.D. No. 140, Maple Creek R.M. No. 111 and L.I.D. No. 112, over 80 per cent was considered submarginal for wheat production.

As noted in a previous paragraph. the municipal units in the eastern edge of the area, namely, White Valley No. 49, Arlington No. 79, Carnicheal No. 109, were definitely superior to the others. In these municipal units, 44, 42 and 48 per cent of the land area, respectively, was Land Class III (fair wheat land) or better.

Comparing the figures for this area with those of the Brown Soil zone and the Dark Brown Soil zone, the two climatic regions corresponding roughly with the open or prairie areas of the province, the low level of productivity of the Govenlock-Eastend-Maple Creek area is apparent. This is shown in Table 3.

Table 3.-Comparison of the Percentage of Total Land Area in Each Land Class of the Govenlock-Eastend-Maple Creek Area with the Brown and Dark Brown Soil Zones of Saskatchewan

Land Class	Govenlock-Eastend and Maple Creek Area	Brown Soil Zone	Dark Brown Soil Zone	Total All Surveys ^{a/}
Percentage of Total Acreage				
I	71.7	45.4	31.2	40.7
II	14.7	17.7	25.4	20.3
III	12.2	22.5	31.8	25.6
IV	1.4	10.7	7.1	9.5
V	-	3.7	4.5	3.9
	100.0	100.0	100.0	100.0
Total Acreage (in thousands)				
	3,889	21,558	10,574	32,132

^{a/} At the end of the 1949 survey in the Elbow-Saskatoon area.

Improved Area

Only about 31 per cent of the total area was improved in 1946. This can be contrasted with about 66 per cent in the Elrose-Rosetown-Conquest 1944 survey area and an equal proportion in the Cory-Asquith-Langham 1943 survey area.

Arranged by land class, 26 per cent of the 1,209,500 acres of improved land was in Land Class I (submarginal for wheat production); 34 per cent was in Land Class II (marginal for wheat production); 35 per cent in Land Class III (fair wheat land); and 5 per cent in Land Class IV (good wheat land). At least one quarter of the improved land in this area was unsuited to wheat growing while an additional one-third was in a doubtful category. In Land Class I, only 11 per cent of the total area was improved as compared with 73, 90 and 98 per cent for Land Classes II, III and IV, respectively. However, due to the larger percentage of the land graded as submarginal and marginal for wheat production these present sizeable acreages of improved land,

A tabulation from the field sheets of land assessors' records indicates that an additional 66,112 acres were physically arable. The fact that 72.5 per cent of this land was located in Land Classes I and II lends some doubt to the advisability of improving it. Actually, only 18,158 acres, or less than one township, was found in Land Class III or better.

A Physical Description of the Area by Land Class

The extensive areas of land graded as Land Class I - submarginal for wheat production, fell into this category largely on account of the low drought resisting characteristics of the land and the low and variable rainfall which resulted in a low level of productivity. Even the gravelly loams and the light loams, the better soils of the Chaplin association, were graded as Land Class I. The coarse texture of the soils of this association and the frequent presence of gravel in the profile resulted in a long time average yield of wheat of about 7 bushels per acre. In some cases and under careful crop management some success has been attained in growing rye. The soils of the Hatton association, and mixtures of this association with other associations, were graded as Land Class I also. The light texture of these soils resulted in rather rapid loss of native fertility under cropping and in a tendency to drift.

The topography of both the Chaplin and Hatton soil associations did not generally hinder crop production except in areas seriously affected by wind erosion. Soils of the lighter phases of the Haverhill, the Fox Valley and Wood Mountain associations were generally placed in this category not only because of low producing capacity as expressed through long-time wheat yields but also because of low arability caused through rough topography, stoniness and other unfavourable physical features.

In this area, a relatively large district on the southern edge was discounted heavily because of the undesirable solonchasic structure of the subsoil. Soils in this district are largely of the Echo association. The "hard-

pan" condition or impervious nature of the subsoil seriously interferes with and often prevents root penetration. Usually it is not the textural quality but the lack of good tilth and unsatisfactory condition for plant growth which makes these soils undesirable. Where "burn-out" pits are numerous, productivity is seriously impaired especially under arid conditions. When the pits are not numerous and not exposed to the surface, relatively good crops may be produced. There is some evidence^{1/} to indicate that frequent and proper cultivation, as well as timeliness of operation, may improve the condition of these soils. The average farmer's experience has not been favorable, however, and has resulted in much abandonment and migration from these districts.

In the Cypress Hills area, the large number of parcels were graded as Land Class I because of the strongly rolling to steep topography, numerous coulees and gullies and eroded or shallow soils.

Extensive areas of Land Class II were found in the rural municipalities of Frontier No. 19, White Valley No. 49, Reno No. 51 and R.M. Bitter Lake No. 142. The typical soils were clay loams and mixtures of clay loams to loams of the Echo, Haverhill and Robsart associations. Typical parcels of land had about 100 to 125 arable acres. Stones were of moderate to frequent occurrence and in several instances low-lying and saline soils were encountered. Damage by wind erosion was quite evident in many cases. The topography was generally of a rougher nature than found in Land Class III parcels - usually moderately rolling to rolling.

The largest areas of Land Class III parcels were found in the four eastern rural municipalities. In White Valley No. 49, east and south of the town of Eastend, more than two-fifths of the area was Land Class III, while in the rural municipalities of Arlington No. 79 and Carmichael No. 109 approximately one-third of the parcels were in this category. The area in this

^{1/} An address on Cultural and Conservation Practice and Management of "Burn-Out" Soils delivered to Radville Board of Trade on Farmers' Night, April 29, 1948 by G.L. Leves, Operator of Radville Experimental Substation.

class represents the western extension of the relatively good block of land in the Shumavon to Gull Lake districts.

Soils typical of this class of land were "Robsart to Haverhill" clay loam; "Wood Mountain to Haverhill" clay loam; "Wood Mountain" loam; "Wood Mountain" clay loam to loam; and "Cypress" loam and clay loam to loam. Parcels of land having at least 140 acres arable were included in this class while the odd parcels on superior soil type were included when having only about 110 acres arable. The soils of the "Wood Mountain" association are found on the lower slopes of the Cypress Hills. The prevalence of eroded valleys and slopes limited the amount of arable land; in many cases the land was utilised for grazing.

Parcels graded as Land Class IV were generally found on clay, silty clay and the superior clay loam soils of relatively level topography. The largest areas of Land Class IV parcels were in R.Ms. Nos. 79 and 109. These were located on soils of the Cypress, Wood Mountain and Fox Valley associations. All parcels were practically fully arable, with a limited number of stones and of relatively level topography. The wheat yields experienced by farmers on these soils were the most satisfactory of any in this area. The presence of the majority of parcels classified as fair and good wheat land on the eastern slopes of the Cypress Hills, indicated higher moisture efficiency prevailing there. Examination of the soil revealed features more comparable with those of the Black and Dark Brown soil zones.

Ownership of Land

The control of land with respect to ownership varied markedly from other comparable survey areas. Only about 54 per cent of the land area was owned by private persons and less than half (48 per cent) by those

usually living in the locality. The Eyebrow-Lacadena^{1/} and Weyburn-Estevan^{2/} areas were the only comparable areas indicating a low percentage of land owned by private persons in the locality. The balance of the land area varied considerably, however, as between the other types of private ownership and public ownership.

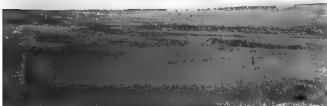
In five municipal units less than one-third of the land was privately owned. These were Local Improvement Districts Nos. 20, 21, 22, 52 and 81. In these municipal units together with Local Improvement Districts Nos. 82 and 140, about two-thirds of all parcels were under control of the Crown and were either leased to private persons or organized in community pastures. A total of 241,022 acres was in community pastures in 1946 in parts of 8 of the 20 municipal units. These may be noted in Figure 1.

As one-third of the area was under the control of the Provincial Department of Agriculture and an additional seven per cent was in community pastures and other governmental agencies, about two-fifths of all lands were under control of either the Provincial or Federal Government. An additional 125,623 acres or 3.2 per cent was in the name of the rural municipalities.

Only 2.5 per cent of the land area was owned by other than private persons or governmental agencies. About half of this, 62,579 acres, was shown by municipal records to be owned by mortgage, insurance or trust companies.

^{1/} "An Economic Classification of Land and Its Relation to Farm Income, Eyebrow-Lacadena Area, Saskatchewan, 1939-1940," C.C. Spence, S. Mysak and R.A. Stutt, Processed Report, Dominion Department of Agriculture.

^{2/} "An Economic Classification of Land in the Weyburn-Estevan Area, Saskatchewan, 1941," R.A. Stutt and S. Mysak, Processed Report, Dominion Department of Agriculture.



Flock of sheep on range land (Land Class I) near Piapot.



Horses on pasture in Cypress Hills - a fast disappearing ranch enterprise.

Table 4.-Land Ownership^{a/} by Land Classes, Govenlock-Eastend-Maple Creek Area, Saskatchewan 1946

	I	II	III	IV	Total					
	acres	%	acres	%	acres					
Private Owner Living:										
In Locality	969,158	34.7	473,370	82.9	397,345	83.9	45,469	84.3	1,885,342	48.5
Other parts of Saskatchewan	26,680	1.0	12,682	2.2	15,614	3.3	800	1.3	55,776	1.4
Other parts of Canada	64,676	2.3	23,893	4.2	18,594	3.9	1,920	3.5	109,083	2.8
Other Countries	27,359	1.0	11,183	1.9	11,816	2.5	1,118	2.1	51,476	1.3
Total Privately Owned	1,087,873	39.0	521,128	91.2	443,369	93.6	49,307	91.4	2,101,677	54.0
Rural Municipality										
Green Land	116,831	4.2	7,354	1.3	1,438	0.3	-	-	125,623	3.2
Hudson's Bay Company	1,297,928	45.1	18,443	3.2	11,177	2.4	948	1.8	1,288,496	33.1
Railway Companies	18,125	0.7	1,922	0.3	800	0.2	-	-	20,847	0.6
Mort., Ins. & Trust Co's.	7,740	0.3	954	0.2	-	-	-	-	8,694	0.2
Community Pasture P.F.R.A.	26,279	0.9	18,305	3.2	14,475	3.0	3,520	6.5	62,579	1.6
Other Government	21,022	8.6	-	-	-	-	-	-	21,022	6.2
Other	31,301	1.1	3,196	0.6	2,394	0.5	160	0.3	37,051	1.0
	2,634	0.1	-	-	-	-	-	-	2,634	0.1
Total	2,789,733	100.0	571,302	100.0	473,653	100.0	53,935	100.0	3,888,623	100.0

^{a/} Information obtained from last assessment roll of each municipal unit.

^{b/} Includes P.F.R.A. lands held in reserve for irrigation, Provincial Forest Reserves, and a small amount of land held by Soldier Settlement Board or Veterans' Land Act at the time of the survey.

^{c/} Townsites.

Because Land Class I makes up such a large proportion of the total area, this grade influences strongly the percentage of land ownership in each type. Outside of this land class the majority of land is owned by those actually residing on the land.

Most of the land under the control of government agencies and the municipal divisions is of a low quality (Land Class I). This is also true of the lands held by the Hudson's Bay Company and the Railway Companies, but not for those held by mortgage, insurance or trust companies.

Occupancy of Land

In 1946, at the date of survey, 89.7 per cent of all land was occupied for arable farming or grazing purposes by persons resident in the vicinity or nearby. Eight per cent was utilized for grazing by means of community pastures. This proportion differs from that indicated in Table 4, by the amounts of land held under ownership other than P.F.R.A., such as Forest Reserves, Indian Reserves and private or company land.

Only 1.7 per cent of the land area or 66,509 acres was vacant in 1946 and had not been used for other than grazing in the past, while 0.6 per cent or 24,959 acres had been abandoned as crop land. No doubt the amount of abandoned crop land is considerably less than would have been reported during the 1930's. Since those years, however, considerable crop land has been brought back into production after a series of years in and out of cropping. Only in Rural Municipality of Frontier No. 19 and Local Improvement District No. 20 was the proportion of vacant and abandoned land significant. In these municipal units, the proportions of vacant land to total land acreage were 2.8 and 7.7 per cent respectively.

Outside of the lands classified as submarginal for wheat production (Land Class I), nearly all was occupied (see Table 5).



A superior type of farmstead with shelter belt. Farmsteads are widely separated in this area.



The Swift Current Experimental Station, an important and widely used source of agricultural information for Southwest Saskatchewan farmers.

Table 5.-Area of Occupied Land, Community Pastures, Vacant and Abandoned Lands
in Twenty Municipal Units,
Govenlock-Eastend-Wesley Creek Area, Saskatchewan 1946

	Land Class								All Land Classes	
	I	II	III	IV	I	II	III	IV	Acres	%
Occupied	2,396,267	85.9	565,544	99.0	471,251	99.5	53,935	100.0	3,486,997	89.7
Community Pasture	310,158	11.1	-	-	-	-	-	-	310,158	8.0
Vacant	64,748	2.3	1,120	0.2	641	0.1	-	-	66,509	1.7
Abandoned	18,560	0.7	4,638	0.8	1,761	0.4	-	-	24,959	0.6
Total	2,789,733	100.0	571,302	100.0	473,653	100.0	53,935	100.0	3,888,623	100.0

Tenure of Lands

Lands devoted to agricultural cropping purposes amounted to 55.3 per cent in 1946 while over one-third (34.1 per cent) was leased for grazing purposes. An additional 8.2 per cent found in community pastures was utilized for grazing. Thus, at least two-fifths of the total area was used for farm grazing or extensive cattle or sheep ranching.

The breakdown in tenure indicated a general single wheat enterprise type of farm on the superior grades and a wheat-cattle farm type on the inferior grades.

The balance of the area was made up of townsites, etc., or all lands not used for cropping or grazing aside from vacant and abandoned lands. The breakdown of the occupied acreage by land class is shown in Table 6.

Considering the category termed agricultural lands, (see Table 6), the proportion owned was three to one as compared with rented land for Land Class I; two to one for Land Classes II and III; and one and one-half to one for Land Class IV.

In Land Class I, less than two-fifths of the total area was devoted to agricultural purposes as compared with nearly 100 per cent for the other classes of land. Nearly one-half of the Land Class I area was leased for grazing mainly from the Lands Branch, Saskatchewan Department of Agriculture. All lands included in community pastures were graded Land Class I.

Other than Land Class I, practically all lands were used for agricultural purposes. Arranged according to municipal unit, the information indicates that the percentage of owned and rented agricultural land was highest in four municipalities on the eastern edge of the area and in the rural municipalities of Piapot No. 110 and Maple Creek No. 112. In the latter two municipalities, a high proportion of the owned land was used for grazing, not ordinarily included as agricultural land.

Table 6.-4 Tenure of Occupied Acreage Arranged by Land Class,
Govenlock-Eastend-Kaple Creek, Saskatchewan 1946

	Land Class								Total
	I	II	III	IV					
	Acreage	%	Acreage	%	Acreage	%	Acreage	%	
Owned	772,082	28.5	371,613	65.7	302,617	64.2	30,616	56.8	1,476,928
Rented	281,382	10.4	172,747	30.5	148,965	31.6	21,079	39.1	624,173
Total Agricultural Land	1,053,464	38.9	544,360	96.2	451,582	95.8	51,695	95.9	2,101,101
Leased from Provincial Government	1,146,904	42.4	4,793	0.9	958	0.2	-	-	1,152,655
Leased from Other	140,896	5.2	1,281	0.2	638	0.2	-	-	142,815
Total Leased Grazing Land	1,287,800	47.6	6,074	1.1	1,596	0.4	-	-	1,295,470
Community Pasture	310,158	11.5	-	-	-	-	-	-	310,158
Other	55,003	2.0	15,110	2.7	18,073	3.8	2,240	4.1	90,426
Total	2,706,425	100.0	565,544	100.0	471,251	100.0	53,935	100.0	3,797,155

Over half of the occupied land was utilized through community pastures in Local Improvement District No. 21, while in Local Improvement District No. 22 and Rural Municipality of Big Stick No. 141, the percentages were 34.4 and 20.9, respectively. Municipal units in which at least two-thirds of the occupied land was used through a lease or community pastures for grazing were Local Improvement Districts Nos. 20, 21, 22, 52, 81 and 140.

Assessed Value of Occupied Lands

The assessed valuations for occupied parcels of land for which information on assessment was available were in agreement with the rating of the land classification. A re-assessment of lands, based on the new system inaugurated in 1939, was made in this area in 1944 and in the spring of 1945. The average assessed values per acre were \$2.81, \$7.07, \$10.74 and \$14.92 for Land Classes I, II, III and IV, respectively. These averages amount to about 80 per cent of the averages for comparable land classes in the Elrose-Rosetown-Conquest area.^{1/} These differences are due to the prevalence of several unfavourable physical factors, such as stoniness, soil conditions and climate, as well as higher transportation rates in this area. Deductions from the basic index rating of the typical soil type for these detrimental factors result in relatively lower levels of assessment valuations as compared with the Elrose-Rosetown-Conquest area.

A summary of the assessment valuations arranged by land class for each municipal unit is given in Table 7.

^{1/} An Economic Classification of Land in the Elrose-Rosetown-Conquest Area 1944. R.A. Stutt. Processed Report, Dominion Department of Agriculture.

Table 7.-Assessed Value of Occupied Land Per Acre by Land Classes
for Rural Municipalities^{a/}
Govenlock-Eastend-Maple Creek Area, Saskatchewan, 1946

R.M. or L.I.D.	No.	Land Class				Total
		I	II	III	IV	
- dollars per acre -						
Frontier	19	3.08	7.14	9.40	-	5.26
L.I.D.	20	2.50	6.69	9.61	-	3.51
L.I.D.	21	2.78	6.44	9.10	-	3.74
L.I.D.	22	2.24	6.77	8.72	-	2.72
White Valley	49	3.31	7.39	10.38	14.29	7.68
L.I.D.	50	2.68	7.26	10.33	-	4.57
Reno	51	2.73	6.73	9.55	-	4.86
L.I.D.	52	2.28	6.43	9.31	-	3.08
Arlington	79	3.35	7.92	11.25	14.15	7.63
L.I.D.	80	2.78	7.07	10.27	14.83	4.20
L.I.D.	81	2.30	5.82	-	-	2.46
L.I.D.	82	2.44	6.52	8.21	-	2.64
Carmichael	109	4.09	8.17	11.80	-	8.98
Pisapot	110	3.55	7.59	11.16	16.10	5.03
Maple Creek	111	3.21	6.90	9.38	-	3.54
L.I.D.	112	3.10	6.62	8.85	-	3.71
Oull Lake	139	2.92	7.26	12.21	16.56	6.26
L.I.D.	140	2.28	5.23	7.75	-	2.59
Big Stick	141	3.12	7.11	10.33	-	5.15
Bitter Lake	142	2.88	6.76	9.16	-	4.62
Average Value		2.81	7.07	10.74	14.92	4.74
Low		2.24	5.23	7.75	14.15	2.46
High		4.09	8.17	12.21	16.56	8.98
Range		1.85	2.94	4.46	2.41	6.52
Variation of Range to Average Valuation		65.8%	41.6%	41.5%	16.2%	137.6%

^{a/} Excluding parcels in community pastures and parcels with no assessment or no information.

Not only is the average assessed value per acre less for each land class in this area as compared with the Elrose-Rosetown-Conquest area, but the variation of range by municipal unit to the average valuation is also greater. In the Elrose-Rosetown-Conquest area, these figures were 48 per cent for Land Class I and 25, 20 and 12.5 per cent for Land Classes II, III and IV, respectively.

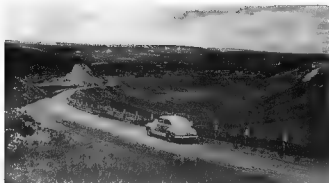
The information on land assessment indicates considerable variation within each land class caused by a wide range in the factors bearing on the valuation. In general, it indicates also a relatively low level for each class of land in this area. The comparison of the average assessed value of \$4.74 per acre for all parcels in this area with the average of \$12.90 in the Elrose-Rosetown-Conquest area, a relatively good prairie area, indicates its position for arable agriculture.

Soil Erosion

More consideration is being given by farmers and scientific agricultural workers to the problem of soil erosion. In many cases soil erosion has reached serious proportions in this area. The erosion of soil through wind and water is invariably accompanied by loss of soil fertility and productivity, as reflected by lower crop yields.

Before a plan for control of soil erosion can be effectually laid out, it is first necessary to study the extent of damage. This information is necessary also in order to acquaint those on the land and the general public with the seriousness of the problem. Information as to the type, extent and severity of soil erosion^{1/} was available from the field sheets of the Saskat-

^{1/} Type of erosion was listed under three main types, as follows: (1) wind, (2) water, and (3) a combination of wind and water. Deductions for erosion were made only for cultivated and cultivated idle land. With regard to extent, parcels were coded in the following groups: no acres affected; up to 40 acres affected; 41-80 acres affected; and over 80 acres affected. Parcels having up to and including 5 points deducted were termed slightly to moderately affected; from 6-15 points deducted as moderately severely to severely affected; and over 15 points deducted as very severely affected.



Eastend, typical town of Southwest Saskatchewan nestled
in Frenchman River valley.



Eroded hills near Eastend showing deposits of white clay which is
shipped to Medicine Hat and used for making pottery. Land used
extensively for grazing.

chewan Assessment Commission. Deductions were made for this condemnation factor from the gross valuation. Only 7.1 per cent of the parcels with some cultivation had no damage from erosion. The distribution of parcels according to the type and extent of damage is indicated in Table 8.

Table 8.-Distribution of Land Parcels^{a/} Having Some Cultivation
According to Type, Extent and Severity of Erosion,
Govenlock-Eastend-Maple Creek Area, Saskatchewan 1946

Extent and Severity	All Land Classes				
	No Damage	Wind	Water	Wind & Water	Total
- number of parcels -					
No cultivation	831				831
Up to 40 acres affected-					
Slightly to moderately	-	980	80	186	1,246
Moderately severely to severely	-	8	-	1	9
Very severely	-	1	-	-	1
Total		989	80	187	1,256
41-80 acres affected-					
Slightly to moderately	-	1,926	70	427	2,423
Moderately severely to severely	-	9	-	1	10
Very severely	-	3	-	-	3
Total		1,938	70	428	2,436
Over 80 acres affected-					
Slightly to moderately	-	5,560	95	1,540	7,195
Moderately severely to severely	-	15	-	1	16
Very severely	-	2	-	-	2
Total		5,577	95	1,541	7,213
All Parcels	831	8,504	245	2,156	11,736

^{a/} Usually 160 acres

Wind erosion was of widest extent. Approximately two-thirds of all parcels damaged by wind erosion had over 80 acres affected, mainly in the slight to moderate category. All the parcels moderately severely to severely and very severely affected were damaged by either wind or wind and water type.

In comparison with another prairie area, the Elrose-Rosetown-Conquest area, more parcels in the present area were damaged, and wind damage was more pronounced. The damage, however, was not as severe as in the comparable area of 1944. This may have been due to the general prevalence of medium and coarse-textured soils in the Govenlock-Eastend-Maple Creek area as contrasted with extensive areas of heavy-textured clay loam and clay soils in the 1944 Elrose-Rosetown-Conquest area.

Arranging the parcels according to Land Class, more damage relatively was found on the parcels of superior grade. In Land Class I (submarginal for wheat production), 13 per cent of all parcels had no damage; 71 per cent had wind damage; 3 per cent had water damage; and 13 per cent had a combination of wind and water damage. In Land Class IV (good wheat land), there were no parcels without damage; 74 per cent had wind damage; 1 per cent had water damage; and 25 per cent had a combination of wind and water damage. In this area, water erosion was found mostly on Land Class I, along the water courses. This was at variance with the prevalence of water damage on Land Classes IV and V in the clay soils of the Elrose-Rosetown-Conquest area.

When expressed in terms of the proportion of improved-acreage, rather than parcels affected, more damage is indicated. Only four per cent of the improved acreage had no damage as compared with about seven per cent of the parcels. Over three-quarters of the improved land had wind erosion of various degrees and one-fifth had a combination of wind and water damage. Two per cent had water erosion damage.



A section of the reservoir, Eastend Irrigation Project west of the town in Frenchman River valley.



A section of Eastend Irrigation Project showing unused irrigable land in foreground and fully developed irrigated block farther down the valley.

The distribution of improved acreage affected is shown in Table 9.

Table 9.-Improved Acreage Affected by Erosion for Parcels
Having Some Cultivation
Govenlock-Eastend-Maple Creek Area, Saskatchewan 1946

Cultivated Acres Affected:	Type of Erosion				Total
	No Damage	Wind	Water	Wind & Water	
- Acres -					
No cultivation affected	47,225				47,225
Up to 40 acres affected-					
Slightly to moderately	-	34,321	2,468	6,365	43,154
Moderately severely to	-	250	-	35	285
severely	-	25	-	-	25
Very severely					
Total		34,596	2,468	6,400	43,464
41-80 acres affected-					
Slightly to moderately	-	130,819	4,728	29,389	164,936
Moderately severely to	-	625	-	70	695
severely	-	180	-	-	180
Very severely					
Total		131,624	4,728	29,459	165,811
Over 80 acres affected-					
Slight to moderately	-	735,501	11,806	203,028	950,335
Moderately severely to	-	1,910	-	150	2,060
severely	-	320	-	-	320
Very severely					
Total		737,731	11,806	203,178	952,715
All Parcels	47,225	903,951	19,002	239,037	1,209,215

Most of the improved acreage (82 per cent) affected by erosion was in blocks of land at least 80 acres in size. There were 47,225 acres indicated as having no erosion damage; 1,158,425 acres were slightly to moderately affected, 3,040 acres moderately severely to severely affected and 525 acres very severely affected.

The information shows that the proportion of improved acreage affected increased from 91 per cent for Land Class I to 100 per cent for Land Class IV. Most of the blocks of land damaged by erosion in Land Class I ranged in size from 40 to 80 acres while in the other land classes they were mostly over 80 acres in size. The extent of the area affected was of relatively significant proportions on all classes, particularly with respect to wind damage. The acreage affected by water erosion only, 19,002 acres, while relatively small, merits consideration because of the difficulties of control.

A SUMMARY OF FINANCIAL AID

Information is available on the assistance provided to farmer residents of this area in the form of relief and agricultural aid for two periods.^{1/} In addition, the data for other governmental payments - Prairie Farm Assistance, Prairie Farm Income and Wheat Acreage Reduction - were summarized. While these data do not give a full account of financial aid in this area, they do indicate the extent of assistance supplied to farmers with respect to type of distress in the past.

Respecting the relief aid, accurate information is available for two general periods - from 1919 to 1922 and from 1930 to 1939. Total advances in the first period amounted to \$620,181 for the twenty municipal units of this area. These advances were for direct relief or sustenance of farm families, for agricultural aid such as seed grain, feed and fodder, and for other

^{1/} Supplied through the courtesy of Supervisor of Statistics, Saskatchewan Department of Agriculture.

municipal relief and guaranteed bank loans. Advances of a similar nature, but of increased magnitude in the latter period, totalled \$6,629,283. Thus during these two periods a total of \$7,249,463 of governmental aid was provided to farmers to enable them to carry on farming operations and to subsist.

The repayments of these advances has not been complete. While over one-half of the 1919-22 advances (\$354,551) were repaid up to 1939, only about 3.3 per cent of the 1930-39 advances (\$219,180) were repaid. Some progress had been made since 1939 and the total debt, exclusive of cancellations, as of November 30, 1946, was \$6,342,032. This means that \$907,431 or only 12.5 per cent had been repaid at that date.

The records of repayments arranged by municipal units show considerable variation. The actual percentage retired by farmers in this area ranged from 6.5 per cent in Local Improvement District No. 80 to 20.7 per cent in Local Improvement District No. 112. Taking the amount of cash repayments into account, however, the Rural Municipalities of Carmichael No. 109, White Valley No. 49 and Big Stick No. 141 had the best record. In these municipal units a total of 91, 86 and 70 thousand dollars, respectively, were repaid, the percentage of total advances being 14.8, 14.4 and 15.1 per cent, respectively.

By means of cancellations of debt, however, the relief debt of this area has been reduced by \$4,288,947. Thus, by the end of November, 1946, nearly three-fifths of all advances for direct relief and agricultural aid had been written off. In some cases, only about 50 per cent was cancelled (e.g., Rural Municipality of Pisapot No. 110 and Rural Municipality of Gull Lake No. 139), as compared with 71 per cent in Local Improvement District No. 81 and 68 per cent in Local Improvement District No. 82. Variations in the percentage of debt cancelled were due to differences in the type of relief programs for which the advances were made and to differences in arrangements regarding cancellations. There were two municipal units (Nos. 19 and 79) with cancellations

exceeding 400 thousand dollars; three municipal units (Nos. 49, 51 and 109) with cancellations between 300 and 400 thousand dollars; five municipal units with cancellations between 200 and 300 thousand dollars; seven municipal units with cancellations between 100 and 200 thousand dollars; and three municipal units (Nos. 22, 81 and 82) with cancellations less than 100 thousand dollars. The total net debt for these twenty municipal units, as of November 30, 1946, amounted to \$2,053,085. This was 28.3 per cent of the total advances in the two general periods. The largest amounts still outstanding at this date were \$219,887 in Rural Municipality of Arlington No. 79, and \$211,597 in Rural Municipality of Gull Lake No. 139. These amounted to about one-third of the total advances in each case. The lowest percentage of net debt (16.6 per cent) was in Local Improvement District No. 112 which, it will be recalled, repaid the largest proportion of its relief advance.

In addition to the relief mentioned in the preceding sections, it should be pointed out that the Dominion Government supplied seed grain to the value of \$8,655,698 in the 1914-15 season in Saskatchewan. Records of these accounts are incomplete, and a statement by municipal units is not possible at this time; however, the southwestern section of the Province extending from Range 10, west of the Third Meridian, to the Alberta boundary and from the South Saskatchewan river to the United States border, received practically all of these advances. The economic survey reported herein is wholly within this area.

The payments made to farmers under the Prairie Farm Assistance Act points to the necessity of some adjustment of land use to conform with a desirable balance of farm population with the available natural land resources. During the seven-year period from 1939 to 1945, farmers in about one-third of the townships of this area received Prairie Farm Assistance payments for five or six years. No payments were made in this area in 1942. In addition, farmers in another one-third of the townships received payments for four years of the six

years during which the Act was in force. Since 1939, when the Act went into force, and until the end of the 1945 season, a total of \$2,897,445 was given out in the form of Prairie Farm Assistance. Total amounts paid out ranged from \$246,984 in 1941 to \$1,054,340 in 1945.^{1/} The number of farmers in this area receiving these benefits ranged from 1,512 in 1940 to 2,805 in 1945. The average payment per farmer receiving a payment ranged from \$150 in 1941 to \$376 in 1945. In 1944 the average payment was \$301, while average amounts of \$221, \$201 and \$165 per farm were received in 1943, 1940 and 1939, respectively.

In 1941, in addition to the average amount of \$150 received through Prairie Farm Assistance, 3,027 farmers in this area received an average payment of \$103 for Prairie Farm Income, which was designed to raise the level of farm income on account of low prices. A sum of \$311,985 was spent in this area.

Other government payments in this area, which cannot be classed in the same class as assistance payments, were Wheat Acreage Reduction payments. These payments were designed to reimburse farmers for adjustments and reductions of certain crop acreages, notably wheat, in conformity with governmental policy stimulated by wartime needs. The total Wheat Acreage Reduction payment in the Govenlock-Eastend-Maple Creek area was \$1,382,404 for the three years of 1941, 1942 and 1943 when the Act was in force. Nearly one-half of this amount was paid out in 1941. About 2,000 to 2,200 farmers received Wheat Acreage Reduction payments for each year. These averaged \$290 in 1941, \$156 in 1942 and \$200 in 1943.

^{1/} No payments were made in 1942, which was a good crop year.

Rehabilitation of farms and farmers was further assisted through the many branches of Prairie Farm Rehabilitation (P.F.R.A.), which points to the hazardous nature of arable farming in this semi-arid area.

WHEAT YIELD ANALYSIS

In the analysis of these data, as in the case of the wheat yield records for the Elrose-Rosetown-Conquest area in 1944, the records were arranged according to the soils mapping conducted by the field evaluators of the Saskatchewan Assessment Commission. This mapping uses the reconnaissance map in Soils Report No. 12, prepared by the Soils Department of the University of Saskatchewan, as its basis.

Because of the difficulty of obtaining a significant number of wheat yield estimates on each soil type, it was decided to group soil types having similar characteristics and a similar soil rating as expressed by the Comparative Soil Rating.^{1/} The long-time average yields of wheat for these groups were basic to determining the productivity index rating in the classification procedure for each quarter section of land according to its best use, namely, wheat production. Individual long-time averages of certain soil types, however, were calculated where the size of the sample was sufficiently large as to provide a satisfactory amount of reliability (see Table 11).

During the course of the economic survey in the months of June, July and August, 1946, 162 short farm schedules dealing mainly with wheat yield estimates for the 1921-45 period were obtained. In addition, wheat yield estimates were included on 126 of the 317 complete farm business records obtained at that time.

^{1/} A full description of the methodology and background of this rating can be found in Scientific Agriculture 20:5:40. See article entitled "A Method of Obtaining a Comparative Rating of Saskatchewan Soils," by Dr. John Mitchell.

An arbitrary number of ten soil groups was set up based on the comparative soil rating. Groups I and X are at the extreme range. Group I is an open group having 80 points and over while Group X is made up of all soils having a rating of 31 points and under. Soil Groups II to IX are of equal intervals of 6 points. Because of the character and the small acreages of certain soils in the general area surveyed in 1946, very few records were obtained in Soil Groups I to IV. At the other end of the scale, in Groups IX and X, few records were taken due to the fact that much of the area was not being farmed and operators who were using lands of these grades only were difficult to find. Satisfactory numbers of records were available for Soil Groups V to VIII, the average number of estimates being 74, 70, 82 and 32, respectively. These varied from 52 in the 1921-28 period to 68 in the 1929-36 period and to 87 in the 1937-45 period for a typical soil group, Soil Group VI.

As the number of wheat yield estimates were significant only for Soil Groups V to VIII, only these will be discussed.

In Soil Group V, the soils were mainly clay loam in texture and of the Haverhill, Wood Mountain and Cypress Associations.^{1/} Many mixtures with clays were also in this group, while the only soil type of clay texture was Robsart clay, a relatively recently named soil association. Cypress loam is included in this group because of its high natural fertility and the favourable moisture conditions associated with this soil.

Soil types of Group VI were generally clay loams to loam mixtures of the same associations as indicated for Group V, with the addition of the Fox Valley association and some of the better phases of the Echo Association soils.

^{1/} See Soils Report No. 12, Soils Department, University of Saskatchewan, for a full discussion of all soils in this area.

Typical soils of this group are Fox Valley clay loam, Fox Valley silty clay loam and Robsart clay loam.

Found in Soil Group VII are loams, sandy loams and some light loams (i.e., Cypress light loam). Many mixtures of associations and types are also included in this group, particularly "burnouts" or Echo Association soils with Haverhill, Wood Mountain, Robsart, Fox Valley clay loams to loams.

Soil Group VIII was characterized by a predominance of "burnout" or Echo Association soils. Also found here are loams of the Fox Valley and Robsart Associations. Soil Group IX contains large tracts of light loam soils of the previously mentioned associations with the addition of mixtures of the very droughty soils of the Hatton and Chaplin Associations.

Soils found in Soil Group X (lowest index group) are distinctly inferior, being mainly sandy loams, gravelly loams and fine sandy loams of the Hatton, Chaplin and Fox Valley Associations. Sands and dune sand soils were also included in this group.

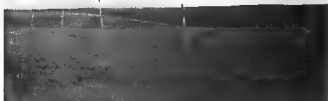
The striking features of the analysis of wheat yields for this area are (1) the low average yields, (2) the wide variability in yield from year to year, (3) the gradual but progressive decline of averages from the superior soils in Soil Groups IV and V to the inferior soils in Soil Groups IX and X, and (4) the generally poor performance of most soil types from 1929 to 1937 and again in 1945. These features are indicated in Table 10.



Mixed farming and grazing area in Cypress Hills.



Forest view in Cypress Hills Provincial Park.



Mixed level plateau and valley grazing land. Note telephone line attached to fence posts.

Table 10.-Average Wheat Yields by Soil Groups, Based on
Farmers' Estimates, Economic Survey
Govenlock-Eastend-Maple Creek Area, Saskatchewan 1946

Year	Soil Group ^{a/}							Total Economic Survey 1946	Supervisor of Statistics
	IV	V	VI	VII	VIII	IX	X		
1921	14.8	14.3	11.4	8.3	8.6	10.0	-	10.6	9.8
1922	20.0	15.9	15.9	12.0	11.5	8.0	-	14.0	15.7
1923	20.0	20.4	19.5	17.6	12.8	12.0	-	18.1	17.7
1924	13.8	13.3	13.5	11.5	9.0	9.0	-	12.1	10.4
1925	15.0	14.8	13.7	11.7	12.1	10.0	-	13.0	11.8
1926	16.0	15.3	11.5	11.5	11.9	6.0	5.0	12.3	9.6
1927	25.0	21.9	22.1	25.2	28.9	8.0	14.2	23.8	25.5
1928	27.0	25.4	28.8	26.9	21.1	22.0	21.2	26.1	26.5
1929	16.0	14.1	14.8	14.3	10.6	14.3	14.4	14.0	11.4
1930	10.0	10.4	10.3	8.8	8.2	8.0	11.2	9.6	11.4
1931	10.0	6.2	5.7	3.5	2.1	4.7	3.6	4.7	3.8
1932	19.0	17.6	18.2	16.6	15.5	11.3	14.8	17.1	15.1
1933	6.0	8.1	7.0	5.8	5.8	5.3	5.6	6.8	5.0
1934	6.5	7.4	5.9	5.8	4.8	5.3	3.8	6.1	4.2
1935	7.5	9.9	6.6	6.6	6.2	6.3	3.8	7.5	5.7
1936	5.0	3.7	2.8	3.0	2.6	2.3	0.8	3.1	1.1
1937	0.0	0.2	0.7	1.0	0.7	0.0	0.0	0.6	0.7
1938	10.0	8.7	9.7	8.7	10.2	6.7	10.3	9.1	8.6
1939	14.3	14.8	14.5	11.8	10.0	10.3	13.9	13.2	11.7
1940	13.0	12.4	10.6	2.9	1.4	6.3	10.3	7.7	9.2
1941	12.0	10.9	11.5	14.0	13.3	7.3	10.0	12.2	12.2
1942	19.8	20.6	23.4	27.4	25.6	17.3	20.6	23.9	21.0
1943	10.4	10.8	9.5	10.2	10.8	8.0	6.7	10.0	7.6
1944	10.0	12.1	7.6	7.1	5.9	3.6	6.0	8.5	7.2
1945	7.8	4.1	3.2	3.1	3.4	3.0	2.0	3.5	3.8
Periods									
1921-45	13.2	12.5	11.9	11.0	10.1	8.3	b/ 8.9	11.5	10.7
1921-36	14.5	13.7	13.0	11.8	10.7	9.0	a/ 8.9	12.4	11.5
1921-28	19.0	17.7	17.1	15.6	14.5	10.9	13.5	16.3	15.9
1929-36	10.0	9.7	8.9	8.0	7.0	7.2	7.2	8.6	7.2
1937-45	10.8	10.5	10.1	9.6	9.0	6.9	8.9	9.9	9.1
d/ 1921-36	13.3	13.2	12.5	11.7	10.3	9.9	9.3		
Average Number of Estimates									
	3	74	70	82	32	2	4	267	

a/ Soil Group - Corresponding to Soil Index Ratings as follows: IV - 62-67;
V - 56-61; VI - 50-55; VII - 44-49; VIII - 38-43; IX - 32-37; X - 31-

b/ 1926-1945. c/ 1926-1936. d/ 1939 Survey Area (bordering the Govenlock-
Eastend-Maple Creek Area on the east side).

The long-time average yield (1921-45) for all records having yield information was 11.5 bushels. When compared with 14.6 bushels per acre in the Elrose-Rosetown-Conquest area for the 1921-45 period and 13.0 bushels per acre in the Cory-Asquith-Langham area for the period of 1921-42, the level of productivity in the Govenlock-Eastend-Maple Creek area is relatively low. The average yields of the twenty municipal units supplied through the courtesy of the Supervisor of Statistics, Saskatchewan Department of Agriculture, indicates general agreement with the average of estimates in this survey.

Comparing the 25-year average (1921-45) with the shorter 16-year average (1921-36), a decrease of about 7 per cent was noted for the longer period. This percentage decline was common to both the 1946 Economic Survey average and the Supervisor of Statistics average. Relatively high yields were obtained during the period 1921-28; average yields in the period 1937-45 increased only slightly over the average for the 1929-36 period. Outside of the high average yields in 1939, 1941 and 1942, the general productivity of the area seems to have remained at a level considerably lower than in 1921-28. There have been only four years since 1929 (1932, 1939, 1941 and 1942) when the yearly average was at least equal to the long-time average.

Generally wheat yields in the Govenlock-Eastend-Maple Creek area show a gradual decline from Soil Group V to VIII, although exceptions to this rule occurred in the years of 1927, 1928 and 1942. These, it will be recalled, were years of relatively high seasonal precipitation in this part of Saskatchewan. Climatic factors such as were present in these years were very favourable for crop development in the Echo soils ("burnouts") and the Robsart soils (soils affected by "burnouts" to a lesser degree). These factors were also comparatively favourable for the sandy and light loam soils in these groups.

A distribution of wheat yields by soil type indicates the same relative position of soil types as is common for the Province. These are shown in Table 11 for two periods - 1921-45 and 1921-36. The averages for the latter period are compared with a similar period average for a block of 56 municipal units east of this area.

The 1921-36 averages for this area were usually higher than the averages for the same period for the 1937-39 survey areas. However, the 1921-45 averages for this area were invariably lower than either 1921-36 averages, indicating lower yields in the period since 1936.

To indicate the variability of wheat yields in this area, the average yields are compared with the median yields for each municipal unit. The relative variability is indicated by the coefficient of average deviation. These are available for the 1918-37 period in a report prepared by Dr. E.C. Hope.^{1/} These are shown in Table 12.

^{1/} An Economic Classification of Land in Seven Municipalities. A doctor's thesis presented to the Graduate School, Cornell University. E.C. Hope, Professor of Farm Management, University of Saskatchewan, 1939, pp. 133-143.

Table 11.-Average Wheat Yields According to Soil Type
and Soil Group, Southwest Saskatchewan,
1946, Economic Survey

	1946 Survey		1937-39 Surveys		1946 Survey
	1921-45 Estimates		1921-36 Estimates		1921-36 Estimates
	* bus. per acre	No.	* bus. per acre	No.	* bus. per acre
Cy-HrCL	12.9	16	13.3	86	14.2
CyCL	12.8	12	15.0	43	14.2
HrCL	12.2	9	12.6	68	12.9
Wa-HrCL	12.1	19	13.4	59	13.3
Others	12.2	18	12.6	102	12.9
Soil Group V (56-61)	12.5	74	13.2	358	13.7
HrCL-L	12.5	6	12.1	112	13.8
FxSiCL	12.2	13	13.0	10	12.6
Ro-HrCL	12.1	20	12.4	41	13.1
Others	11.6	31	12.6	308	12.9
Soil Group VI (50-55)	11.9	70	12.5	471	13.0
Ro-Ec-HrCL	11.4	13	12.3	15	12.2
Others	11.2	36	11.7	75	12.2
Hr-EcCL	10.7	16	11.7	32	11.5
Ro-EcCL	10.6	17	-	-	11.3
Soil Group VII (44-49)	11.0	82	11.7	122	11.8
Others	10.6	2	10.3	28	10.7
HrL-EcCL	10.2	13	10.0	1	10.9
EcCL & EcCL-L	10.1	17	-	-	10.6
Soil Group VIII (38-43)	10.0	32	10.3	29	10.7



Section of camping and accomodation area, Cypress Hills
Provincial Park.



Extensive tourist facilities at Cypress Hills Provincial Park. Note fine
stand of spruce and other mixed tree growth. This wooded area is in
direct contrast to the open prairie surrounding it.

Table 12.-Significant Indicators of Wheat Yields for the Period 1918-1937,
Govenlock-Eastend-Maple Creek Area, Saskatchewan, 1946

Municipal Unit	No.	Average Yield	Median Yield	Coefficient of Average Deviation
		- bushels per acre -		- per cent -
Frontier	19	10.1	8.5	60
L.I.D.	20	11.3	11.2	63
L.I.D.	21	8.7	8.0	62
L.I.D.	22			
White Valley	49	11.2	11.5	54
L.I.D.	50	11.5	12.0	51
Reno	51	9.1	9.0	59
L.I.D.	52	9.6	9.5	54
Arlington	79	12.1	11.0	50
L.I.D.	80	11.4	11.8	55
L.I.D.	81			
L.I.D.	82			
Carnicheal	109	12.7	13.0	53
Pispot	110	10.1	6.8	73
Maple Creek	111	7.8	6.0	75
L.I.D.	112	9.2	7.8	69
Gull Lake	139	9.6	7.0	71
L.I.D.	140			
Big Stick	141	8.0	4.0	75
Bitter Lake	142	8.0	6.2	70
Total		10.0	9.0	62

The tendency for a few years with high yields to distort the more typical picture of productivity is well illustrated by the difference between the mean yield and the median yield. In the municipal units on the southern section of the area, the mean yield and the median yield are fairly close. Here the mean yield ranges from 1.6 bushels more to 0.5 bushels less than the median yield while in the area north of the Cypress Hills, the average yield ranges from 1.4 to 4.0 bushels more.

The coefficient of average deviation indicates the relative variability and in this area it ranged from 51 to 75 per cent above or below the average yield. This means that near crop failures and bumper crops may come in alternative years, while at other times either may persist for three or more consecutive years in fluctuating extremely above or below the normal crop yield. In comparison with other regions, the yield experience in the Govenlock-Eastend-Maple Creek area appears very unfavourable. In northeastern Saskatchewan, average yields of wheat have a variability of about 18 to 30 per cent, while in the six leading fall wheat counties of Ontario the coefficient of average deviation for the period of 1918 to 1937 was from 10 to 12 per cent.

All available information bears out the hazardous nature of farming in this area. While precipitation has the greatest effect on the level of productivity, other hazards such as frost (especially in the Cypress Hills section), hail and grasshoppers also may reduce the anticipated crop yield greatly.



Calf roping competition at Eastend Rodeo 1946, a popular form of summer entertainment in this area.



Steer decorating competition, Eastend Rodeo 1946.

GENERAL SUMMARY

The main features of this area from an agricultural point of view are the relatively low level of average wheat yields, the wide variability from year to year and the extensive nature of arable agriculture and ranching. The uncertainty of crop yields has been characterized by many periods of abandonment of cropland, of migration of settlers to other areas, and consolidation of the remaining farm units. Adjustments in land use to conform with a desirable balance of farm population which can be sustained by the land resource have been in process since the area was opened for settlement. An economic classification of land expresses the ability of the land resource to produce based on the past experience of farmers, and forms a basis to develop a satisfactory policy with respect to land use.

- (1) The number of farms in 1946 in this area was 3,509 occupied farms and 715 non-resident farms. A steady decline has been taking place. Since 1941, there has been a decrease of approximately 9 per cent. The 1946 figures by municipal units show the generally sparse and widely-separated nature of farms and some concentration of the units on the eastern slopes of the Cypress Hills.
- (2) A total area of 3,888,623 acres was included in this area of twenty municipal units. Lands classified as Land Class I - submarginal for wheat production - formed by far the largest single land class. Only in the Rural Municipality of White Valley No. 49 and to some extent in the Rural Municipalities of Arlington No. 79, Carmichael No. 109, and Gull Lake No. 139 did the percentage of any other land class exceed or approach that of Land Class I. These municipal units are on the eastern side of the area.

Arranged according to grade of land, 71.7 per cent was in Land Class I (submarginal for wheat production); 14.7 per cent in Land Class II (marginal for wheat production); 12.2 per cent in Land Class III (fair wheat land); and 1.4 per cent in Land Class IV (good wheat land). There were

no parcels classified as Land Class V (excellent wheat land).

The economic classification of land of all other survey areas in the Brown soil zone shows an average of nearly one-half classified as sub-marginal for wheat production as compared with approximately 72 per cent in this area. The percentage of Land Class II in the past survey areas was 18 per cent, and only slightly more than 15 per cent in the Covenlock-Eastend-Maple Creek area. Past surveys in this soil zone indicated an average of 22 per cent classified as fair wheat land and one-seventh as good or excellent wheat land as compared with about one-eighth or 1.4 per cent of the respective land classes in this area.

- (3) Only about 31 per cent of the total area was improved in 1946. This low proportion is explained by the fact that only eleven per cent of the Class I land was improved.
- (4) Only about 54 per cent of the total area was owned by private persons and less than half (48 per cent) by those actually living in the locality. In Land Class I about 60 per cent was under direct control of various Provincial or Federal Government departments. In the other classes of land, privately owned land exceeded 90 per cent while the balance was mainly owned by the Crown in Land Classes II and III and by mortgage, insurance or trust companies in Land Class IV.
- (5) The general high level of farm income during the recent period was reflected by a relatively low percentage (2.3 per cent) of unoccupied, vacant or abandoned land in 1946. No doubt this is considerably less than would have been reported during the 1930's,

In Land Class I, 86 per cent was occupied farm land and eleven per cent was utilized through community pastures and three per cent was unoccupied. In direct contrast, practically all the other lands were occupied farm lands.

- (6) Considering the occupied lands, about two-fifths of the Land Class I area was classed as agricultural land and used mainly for arable farming, approximately one-half was used for grazing (leased from Government departments and others), and the balance for grazing through community pastures, In the other classes of land about 96 per cent was used for cereal production. Respecting tenure of agricultural land, the proportion owned was three to one as compared with rented land for Land Class I, two to one for Land Classes II and III, and one and one-half to one for Land Class IV.
- (7) The assessed value of Land Classes I, II, III and IV was \$2.81, \$7.07, and \$10.74 and \$14.92, respectively. These average figures were about 80 per cent of those in the Elrose-Rosetown-Conquest area. The variation of range for municipal units to the average valuation was also greater in the Govenlock-Eastend-Maple Creek area. Here the figures were 66 per cent for Land Class I, 42 per cent for Land Class II, 42 per cent for Land Class III and 16 per cent for Land Class IV.
- (8) With regard to soil erosion on parcels of land with cultivation, damage was noted on 96 per cent of the improved acreage. Over three-quarters of the improved land had wind erosion of various degrees of severity, while one-fifth had a combination of wind and water damage. Two per cent had damage from water erosion. There seemed to be more relative damage on the superior grades of land. The information supplied from the field assessor's sheet indicated 1,158,425 acres of the total of 1,161,990 acres with these data as slightly to moderately affected. Only 3,040 and 525 acres were rated as moderately severely to severely or very severely affected. In the poorer grades of land blocks damaged were generally of a size less than 80 acres as compared with 80 acres and over for the better land classes.

DATE DUE SLIP

- (9) Financial aid _____ considerable magnitude, especially _____ period alone over \$6.6 million were _____ about one-eighth of this had been rep _____ belled.
- Other govern _____ the Prairie Farm Assistance Act have be _____ period from 1939 to 1945, farmers in _____ Prairie Farm Assistance payments of _____ years. Another one-third received pa _____ the Act was in force.
- (10) The section o _____ ated a relatively low level of long-tim _____ n yield from year to year, a gradual a _____ the superior soils in Soil Groups IV _____ Groups IX and X, and the generally poo _____ m 1929 to 1937 and again in 1945. T _____ l records was 11.5 bushels. This ca. ¹⁹⁴⁵ _____ ° 6 bushels for the Elrose-Rosetown-Conquest area for the 1921-43 period. There was a tendency for a few years with high yields to distort the more typical picture of productivity. In this area, the relative variability ranged from 51 to 75 per cent as expressed by the coefficient of average deviation.

- (9) Financial aid to farmers in this area has been of considerable magnitude, especially in the 1930 to 1939 period. In this period alone over \$6.6 million were advanced. At November 20, 1946, about one-eighth of this had been repaid and about three-fifths were cancelled.

Other governmental payments especially through the Prairie Farm Assistance Act have been extensive. During the seven-year period from 1939 to 1945, farmers in one-third of the townships received Prairie Farm Assistance payments of various categories for five or six years. Another one-third received payments for four years of the six years the Act was in force.

- (10) The section of the analysis on wheat yields indicated a relatively low level of long-time wheat yields, a wide variability in yield from year to year, a gradual and progressive decline in yield from the superior soils in Soil Groups IV and V to the inferior soils in Soil Groups IX and X, and the generally poor performance of most soil types from 1929 to 1937 and again in 1945. The long-time average (1921-45) of all records was 11.5 bushels. This can be compared with an average of 14.6 bushels for the Elrose-Rosetown-Conquest area for the 1921-43 period. There was a tendency for a few years with high yields to distort the more typical picture of productivity. In this area, the relative variability ranged from 51 to 75 per cent as expressed by the coefficient of average deviation.

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